



THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

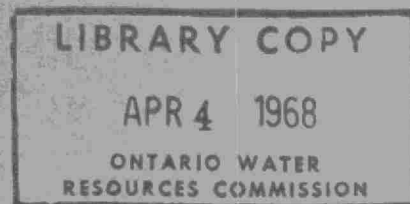
of the

POLICE VILLAGE OF ST. GEORGE

in the

COUNTY OF BRANT

1967



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REPORT
ON A
WATER POLLUTION SURVEY
OF THE
POLICE VILLAGE OF ST. GEORGE
TOWNSHIP OF SOUTH DUMFRIES
COUNTY OF BRANT
1967
DISTRICT ENGINEERS BRANCH
DIVISION OF SANITARY ENGINEERING

REPORT ON A
WATER POLLUTION SURVEY
OF THE
POLICE VILLAGE OF ST. GEORGE
TOWNSHIP OF SOUTH DUMFRIES

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ONTARIO WATER RESOURCES COMMISSION

REPORT

INTRODUCTION

A water pollution survey was conducted in the Police Village of St. George on August 21, 1967. The purpose of the survey was to determine the nature and extent of all sources of domestic and industrial water pollution within the police village as a basis for evaluating sewage treatment requirements.

Mr. W.W. Guthrie, Clerk-Treasurer, Township of South Dumfries, provided pertinent information and assisted in the sampling programme.

GENERAL

The Police Village of St. George, with an assessed population of 858 (1967 Municipal Directory) is located on Highway #5, in the north eastern portion of the County of Brant. St. George lies within the Grand River watershed.

Generally, water drainage consists of a number of small unnamed streams which flow south through the police village and culminate at the west branch of St. George Creek near the lower limits of the municipality. The streams originate from springs in a brown gravelly loam ridge which runs in an east-west direction, immediately north of St. George. Brown loam over a yellowish to greyish stratified fine sand and silt constitutes most of the top soil within the police village.

Sub-division development has begun in the northern section of St. George. The Township of South Dumfries does not have an official plan.

WATER SUPPLY

The Township of South Dumfries has recently purchased the privately owned St. George Supply Company Limited. This system consists of two artesian wells serving without treatment approximately 525 consumers through 206 service connections. The wells are rated at a total of 193,000 gpd. There is a 35,000 gallon ground level storage reservoir in the system and the water mains range from 2.5 to 4 inches in diameter. Approximately 60% of the police village is serviced. The wells and reservoir locations are shown on the accompanying map.

The balance of the police village is serviced by private wells. No more than 5 residences are serviced by any one source.

The Malcolm Condensing Company Limited obtains its water supply from two private wells. The plant is situated in the west central portion of St. George. A 46,000 gallon water reservoir is located under the plant.

WASTE DISPOSAL

Municipal and Private

There are no municipal water pollution control facilities for the collection and treatment of domestic wastes and sanitary

sewage within the police village. The method of disposal of domestic wastes is left to the individual property owner and, in most cases, septic tank systems are utilized. In the business and commercial section of St. George, there is not always enough land available for the installation and operation of adequate field tile waste disposal beds, and as a consequence, pollution problems have resulted.

Industrial

The Malcolm Condensing Company Limited, is engaged in the production of condensed and powdered milk products. During the summer processing season the liquid wastes are disposed of by spray irrigation. During the winter months and during periods when the irrigation system is not operating, the wastes are discharged without treatment to the west branch of the St. George Creek.

Approximate waste loading figures, based on previous reports of the Malcolm Condensing Company in 1967, are given below:

<u>VOLUME (gpd)</u>	<u>AVERAGE CONCENTRATIONS (ppm)</u>		<u>LOADINGS (lbs/day)</u>	
	<u>BOD</u>	<u>SUSP. SOLIDS</u>	<u>BOD</u>	<u>SUSP. SOLIDS</u>
50,000	371	194	18.5	97

Refuse Disposal

The Police Village of St. George uses a 500' X 500' portion of a one-acre open-face dump located in the north part of Lot 15, Concession 13, of the Township of Dumfries South. The site, approximately 2 miles north-west of St. George, is in a low swampy area about 0.5 miles from the nearest body of water. The present

site appears to have adequate space regarding refuse disposal for the near future.

WATER POLLUTION

Analyses from all bacteriological samples collected showed coliform organism counts well above the OWRC objectives of 2,400 coliforms per 100 millilitres.

Samples No. GFSG-68.12W (24 ppm and 268 ppm) and GFSG-68.09W (25 ppm and 30 ppm) results showed high biochemical oxygen demand and suspended solids levels as these drains flowed through the built-up section of St.George. High anionic detergent concentrations were found in samples No. GFSG-68.09 (11.4 ppm) and GFSG-68.11 (14.5 ppm), which were taken from the developed area of the police village. Suspended solids levels above the OWRC objectives of 15 parts per million (ppm) were found in sample No. GFSG-67.84W (21 ppm) and GFSG-68.11 (22 ppm).

Deteriorated water quality conditions in the western and southern sections of St.George were revealed when samples No. GFSG-68.08, GFSG-67.58, and GFSG-67.5 were examined. Particularly high coliform concentrations were noted in sample No. GFSG-67.58 (25,000,000) and GFSG-68.11W (2,030,000).

The impairment of the drains examined can be attributed to the discharge of inadequately treated sanitary wastes from septic tank systems via private drain connections.

Discussions with the Brant County Health Unit officials indicated that septic tank systems have caused pollution problems in the past. Particularly in the main built up sections of the municipality, space limitations prohibit the construction of adequately sized field tile disposal beds. It would appear therefore, that a municipal sewerage system would be the optimum means of correcting the above mentioned pollution problem.

During the winter months and when the irrigation equipment is not operating, the Malcolm Condensing Company Limited directs its liquid wastes to the west branch of the St. George Creek and seriously impairs its water quality. Sample GFSG-65.58 shows a biochemical oxygen demand, suspended solids concentration and coliform organism counts above their OWRC objectives. It has been reported from our Division of Industrial Wastes, that Malcolm Condensing Company Limited is proceeding towards an acceptable method of industrial waste disposal.

The refuse disposal site appears to be of adequate size and location. Therefore, it does not present a source of pollution to any watercourses at this time.

SUMMARY

A water pollution survey was conducted in the Police Village of St. George on August 21, 1967.

The water quality samples collected revealed polluting conditions in the built-up central portion of the police village. Samples taken above and below the Malcolm Condensing Company Limited drains revealed that polluting materials were deteriorating the west branch of the St. George Creek.

At the time of the survey, the refuse disposal site did not appear to be a present or potential source of pollution.

RECOMMENDATIONS

1. The Township of South Dumfries, should institute a pollution abatement programme for waste water treatment which should include the built-up sections of the Police Village of St. George.
2. The Malcolm Condensing Company Limited should continue its efforts to provide an industrial waste disposal method which will not impair the quality of the waters in the west branch of St. George Creek.

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APPENDIX I

INTERPRETATION OF ANALYSES

For convenience in the interpretation of laboratory analyses, the Ontario Water Resources Commission water quality objectives for surface water drains, watercourses and bodies of water are listed below:

Biochemical Oxygen Demand (BOD)

BOD is an indication of the amount of oxygen required by bacteria for the stabilization of decomposable organic matter present in sewage, polluted waters, or industrial waste. This parameter is usually expressed in parts per million (ppm). The BOD test is widely used to determine the pollutorial strength of sewage and industrial waste in terms of the oxygen that they will require if discharged into natural watercourses. Laboratory tests are conducted over a period of controlled incubation. The usual incubation period is 5 days at a temperature of 20°C. A high BOD is indicative of organic or chemical pollution. If toxic materials are present at the time of the analyses, the validity of the test is questionable. The OWRC 5-Day objective for surface water drains is not greater than 15 ppm and for watercourses and bodies of water it is 4 ppm.

Total Suspended and Dissolved Solids

Suspended solids determinations indicate the amount of undissolved solids of organic or inorganic nature, while dissolved

solids are a measure of materials in solution. The two added give a total indication of the amount of solids in the liquid. Determination of the amounts of dissolved matter is accomplished by making tests upon filtered and unfiltered portions of the samples. A recommended maximum limit of suspended solids of not greater than 15 ppm is suggested. This is due to the fact that suspended solids in excess of this amount affect purification and are injurious to the habitant of fish.

Bacteriological Examination

A membrane filter (MF) count of less than 2,400 coliform organisms is considered desirable for bacteriological quality of surface water in Ontario. Coliform organisms are reported per 100 milliliters (ml) of sample, and indicates bacteriological contamination by human or animal excrement.

Anionic Detergent Content (ABS)

The presence of anionic detergent generally indicates pollution from domestic sources.

TABLE I

POLICE VILLAGE OF ST. GEORGE - WATER POLLUTION SURVEYSURFACE WATER DRAINS - ST. GEORGE CREEK

Sampling Point No.	Location	5-Day BOD (ppm)	S O L I D S			Detergents as ABS (ppm)	(MF) Coliform Organisms per 100 ml
			Total (ppm)	Susp. (ppm)	Diss. (ppm)		
GFSG-68.12 W	Drain at High Street between King and Queen Streets	24	1272	268	1004	1.7	118,000
GFSG-69.79 W	Drain at rear of United Church property	1.3	368	48	320	0.1	300,000
GFSG-68.09 W	Drain at High Street between Main and Lorimer Streets	25	524	30	494	11.4	1,600,000
GFSG-68.11 W	Drain at High Street near Lorimer Street	18	464	22	442	14.5	2,030,000
GFSG-68.15 W	Drain at High Street opposite West Street	1.1	332	3	329	0.1	34,000
GFSG-68.0(B) W	Drain from North-West outfall opposite mill (30")	2.6	350	11	339	0.1	108,000
GFSG-67.84 W	Drain at Main Street approximately 250 feet south of Thompson St.	2.3	360	21	339	0.1	205,000
GFSG-68.20 W	Drain at High Street between College and Snowball Streets.	0.5	324	10	314	0.0	50,000

TABLE I CON'T

Sampling Point No.	Location	5-day BOD (ppm)	S O L I D S			Detergents as ABS (ppm)	(MF) Coliform Organisms per 100 ml
			Total (ppm)	Susp. (ppm)	Diss. (ppm)		
GFSG-68.08	West Branch St. George Creek at Hwy. #5	1.1	380	5	375	0.0	Broken in Transit
GFSG-67.58	West Branch of St. George Creek downstream from Malcolm Condensing Co. Ltd.	8.0	396	30	366	0.2	25,000,000
GFSG-67.50	West Branch of St. George Creek at Branchton Rd. below St. George	288	1036	254	782	0.3	750,000
GFSG-68.0(A) W	Drain from North-West outfall opposite mill (10")		No Flow				
GFSG-68.0(C) W	Drain from North-West outfall opposite mill (14")		No Flow				

APPENDIX

IMPLEMENTATION OF WATER AND SEWAGE WORKS PROGRAMS

Currently, there are three general methods which may be utilized for implementing sewage and water works programs. These are: 1) to enter into an agreement with the OWRC for the construction of the treatment and collector works with an obligation to pay the debt retirement and operating charges over the term of the agreement with the facility reverting to the municipality at the end of the term of the agreement, 2) by requesting the provision of service from a Provincially-owned project, and 3) by proceeding with the construction independently and meeting capital costs by the sale of debentures.

OWRC/MUNICIPAL PROJECTS

For the construction of water and sewage works under agreement with this Commission, the works are provided and developed under Sections 39 to 46 of the Ontario Water Resources Commission Act.

For this type of arrangement, the Commission utilizes a sinking fund and consequently the annual payments are based on a specific debt retirement period and the payments are unchanged for the period of the agreement. This type of project may be financed over a period of time up to a maximum of thirty years. The annual charges for projects constructed under this agreement are determined as follows:

1. Capital Repayment

As noted, OWRC financing is by the sinking fund method and an annual payment of approximately 2 per cent of the capital

cost is required to retire a debt over a thirty-year period.

2. Interest

On new Commission projects, interest is calculated at the current rate.

3. Reserve Fund

To provide money for repairs and replacements, Section 40 of The Ontario Water Resources Commission Act provides for the establishment of a reserve fund by the Commission. It is important to note that this fund is established in the name of the municipality and the balance consequently earns interest. It has now been established by Commission minute that the reserve fund billing for each project shall continue only until the fund reaches an amount of ten times the initial annual billing and the reserve fund billing shall be re-imposed only when the fund has been depleted to 80 per cent or less of the maximum amount.

4. Operating Costs

Under OWRC agreement, the municipality is responsible only for the operating costs directly attributed to the project in the municipality. Therefore, no charges are made by the Commission for the services of head office personnel who are available as required to advise on the satisfactory operation and maintenance of the project.

PROVINCIALY-OWNED WORKS

In June, 1967, the Honourable J. R. Simonett, Minister of Energy and Resources Management, made an announcement which expanded the authorization of this Commission for the provision of water supply and sewage treatment facilities. This new program allows the Commission to construct entire water and sewage works facilities for small municipalities. The capital costs of these can be amortized over a 40 year period.

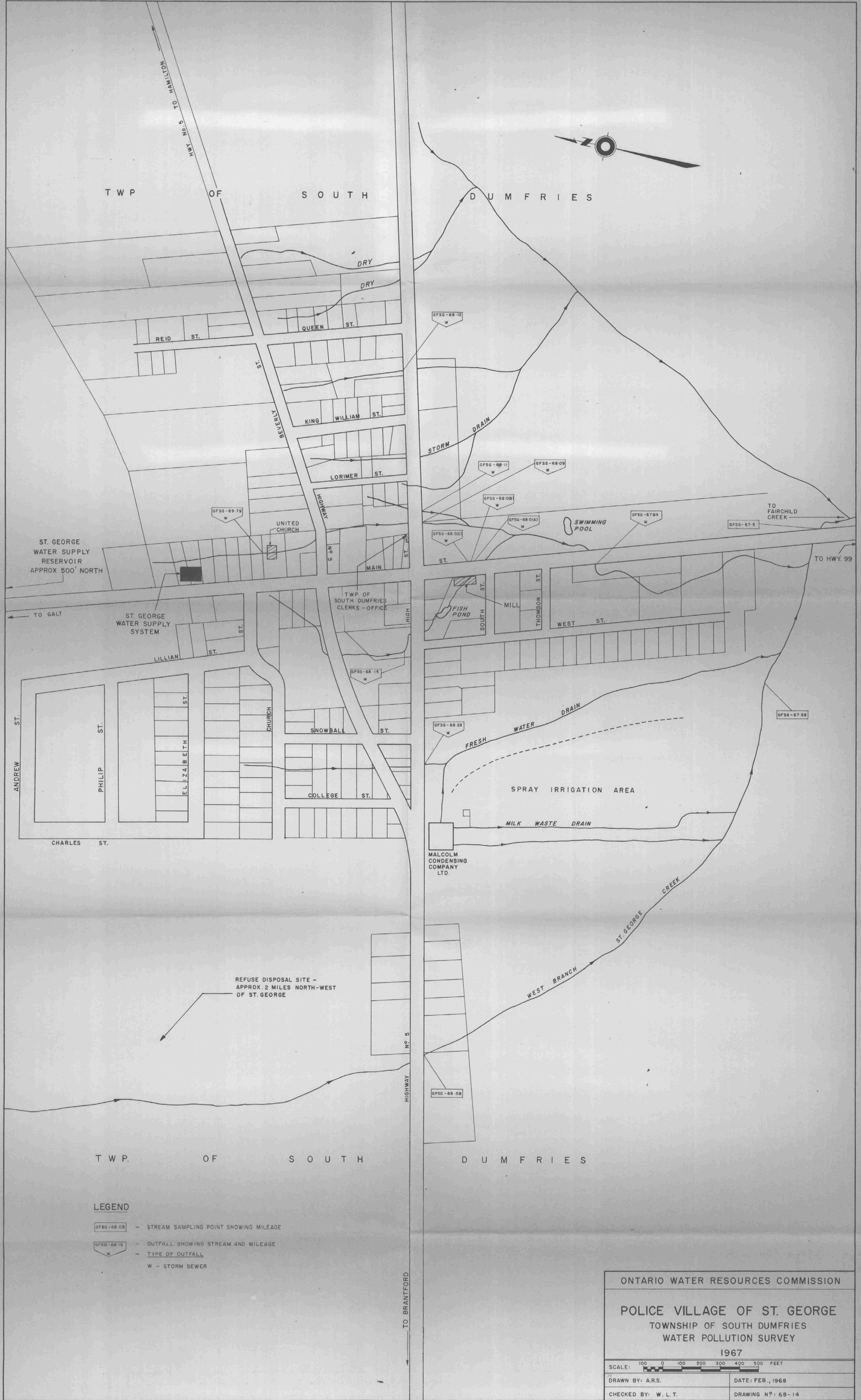
A slight variation of this program could be implemented in that the municipality may request that this Commission provide only the major water and sewage works facilities as Provincially-owned works, and develop the water distribution and sewage collector systems under the standard type of Commission project. It would appear that where applicable, it would be more advantageous for the municipality to proceed on the basis of requesting this Commission to develop entire systems as Provincially-owned works.

The associated cost of supplying these works, including amortization of capital costs, together with operating and maintenance charges, will be recovered by the sale of service to the affected municipalities by rates determined on a usage basis. These facilities will be wholly-owned by the Province of Ontario and the arrangements for service will be formalized by contracts between the Commission and the municipality concerned. The installations will be operated entirely at cost with appropriate provision for adjustment in rate.

DEVELOPMENT

If a municipality, after considering the alternatives, wishes this Commission to consider Provincially-financed projects, application forms should be completed and submitted together with a resolution of the Municipal council. A draft of the suggested wording of the resolution is included with the application forms.

If the proposed works are to be built by the municipality on its own initiative or as a formal project under agreement with this Commission, it is required that the Council retain a consulting engineer to prepare preliminary engineering reports on the proposed work. If a Provincial system is contemplated, no action should be taken with respect to retaining a consulting engineering firm as the Commission will designate a consulting engineer to carry out the Provincial portion of the work and it would be advantageous if the municipal portion be studied and reported on by the same engineer.



LEGEND

- GFSG-68-08 - STREAM SAMPLING POINT SHOWING MILEAGE
- GFSG-68-15 - OUTFALL SHOWING STREAM AND MILEAGE
- W - TYPE OF OUTFALL
- W - STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

POLICE VILLAGE OF ST. GEORGE
TOWNSHIP OF SOUTH DUMFRIES
WATER POLLUTION SURVEY

1967

SCALE: 100 0 100 200 300 400 500 FEET

DRAWN BY: A.R.S. DATE: FEB., 1968

CHECKED BY: W.L.T. DRAWING NO: 68-14



Date Due

[illegible]